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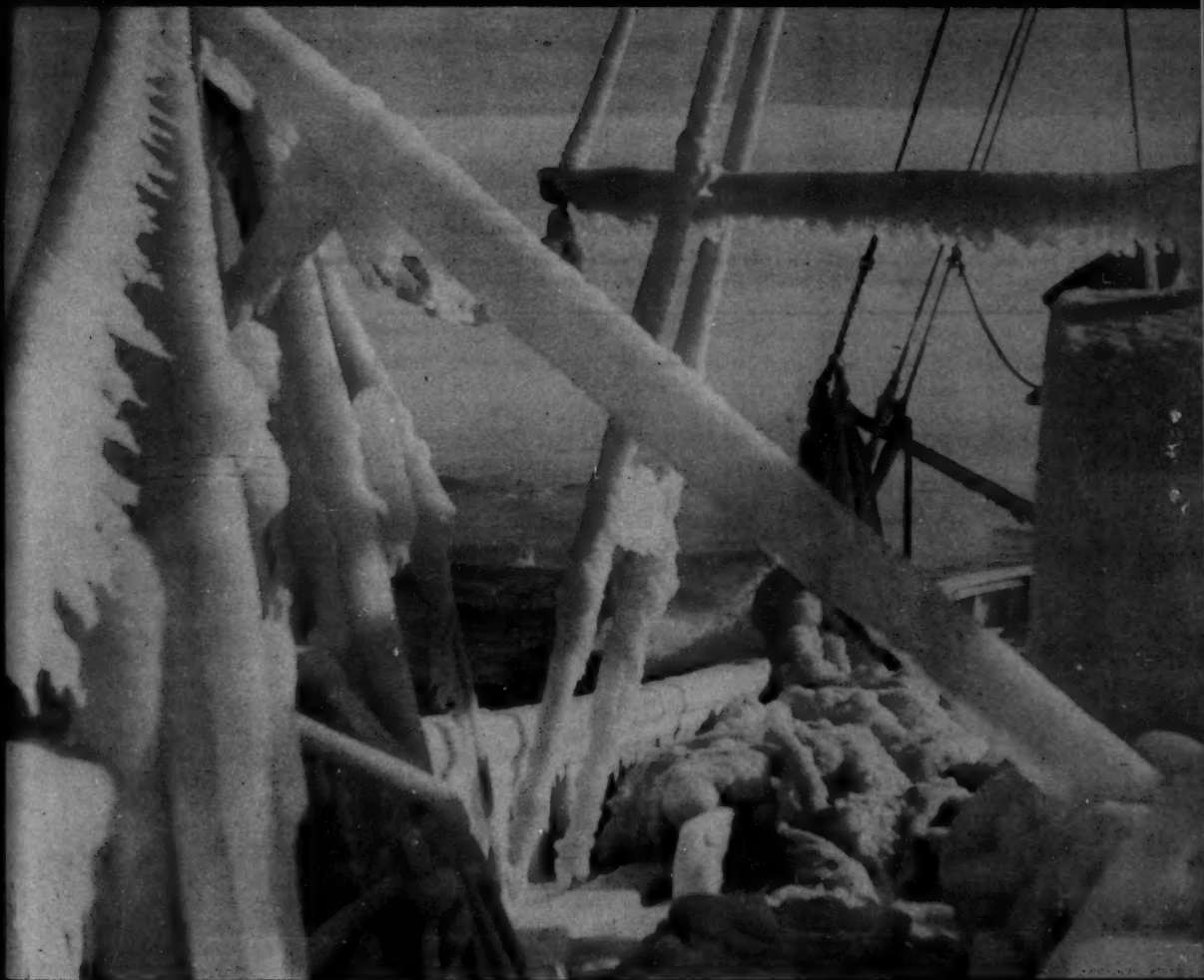
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COMMERCIAL FISHERIES REVIEW



Vol. 10, No. 1

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FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A REVIEW OF DEVELOPMENTS AND NEWS OF THE FISHERY INDUSTRIES
PREPARED IN THE DIVISION OF COMMERCIAL FISHERIES

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Applications for **COMMERCIAL FISHERIES REVIEW**, which is mailed free to members of the fishery industries and allied interests, should be addressed to the
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COMMERCIAL FISHERIES REVIEW

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TECHNOLOGICAL STUDIES OF THE STARFISH

PART I—STARFISH CONTROL—ITS ECONOMIC NECESSITY AND METHODS USED

By Charles F. Lee*

INTRODUCTION

The common five-rayed starfish, *Asterias forbesi*, is a familiar sight in the pools among the rocks of the New England coast. Not so familiar is the fact that the innocent appearing starfish is one of the most destructive enemies of the oyster and that it may cost the oystermen of Long Island Sound over a million dollars per year for control efforts and in seed and market oysters killed.

NATURAL HISTORY AND DISTRIBUTION

In the waters along the shore of Long Island Sound, the lives of the starfish and the oyster are so closely interrelated, that a brief discussion of each is essential to the understanding of starfish control. Galtsoff and Loosanoff (1939) and Loosanoff and Engle (1940) have made extensive investigations of both the starfish and oyster and much of the material presented here represents a summary of information from these sources.

The starfish will spawn when only one year old if conditions for growth have been favorable. Starfish spawning usually starts in June, some two to six weeks earlier than oyster spawning in the same waters. Both the starfish and oyster in the larval form are free-swimming for several weeks before setting on the bottom. When first changed from the larval stage, the young starfish is only about one millimeter in diameter, but it has a voracious appetite and grows rapidly. Having spawned earlier, the young starfish may consume the newly-set oyster spat to the extent of virtually wiping out a good set. For this reason, it is desirable that the beds on which old shells are deposited for the purpose of catching the oyster spat be cleaned of as many adult starfish as possible before they begin to spawn. This will not entirely eliminate starfish, as the larvae in the free-swimming stage may be carried in from some distance by the tide and currents. Such cleansing limits the set, however, and is generally the practice in seed-oyster areas.

The oyster industry of the Long Island Sound area is based on intensive private cultivation. In contrast, on the South Atlantic coast, and to some extent in Chesapeake Bay, oysters are taken from public grounds. In the Sound, almost all of the oysters are grown on privately leased beds and, frequently, they may be moved three or more times during the four to six years it takes them to grow to market size.



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The Long Island Sound seed-oyster industry, in many cases, is thus a separate enterprise from the growing of market oysters. Seed-oysters, a term which in this area refers to oysters from one to two years old, are grown almost entirely in a strip of water three to five miles wide along a stretch of the Connecticut coast line from Stamford to Branford, where experience has shown conditions are optimum for obtaining a good set of spat. Even here, for reasons not yet apparent, good sets are obtained only about one year in five, and in some years the set is almost a total failure. To maintain the supply of market oysters at a profitable level, every effort is made to protect the spat and young oysters from unfavorable conditions and predatory enemies, such as the starfish.



The starfish opens the oyster by wrapping its rays about the shell and exerting a steady prolonged pull by means of the many "tube-feet" which line the under side of each ray. These tube-feet are capable of considerable adhesion, but it is the duration, rather than the degree of pull, which gradually fatigues the large muscle of the oyster so that it relaxes and the shell is opened. The starfish then turns its stomach literally "inside out," to envelop and eat the oyster meat. Some investigators have suggested that the starfish secretes a substance capable of narcotizing the oyster. This ability, if present, is most probably used after the oyster is opened to prevent further closing of the shells.

It is apparent that smaller oysters are more readily and rapidly subject to starfish attack. Therefore, the seed-oyster grower is greatly concerned with starfish control. Large starfish may attack oysters that are three or four years old, but they are more likely to resort to easier prey such as mussels, small clams, crepidula, or several other species of small mollusks.

The surveys of Galtsoff and Loosanoff (1939-40) have shown the depth distribution of starfish to be very similar to that of the oyster of the same waters. Almost all of the cultivated oyster beds, as well as the natural public beds, are in less than 30 feet of water and the great majority of the starfish were found in depths of less than 40 feet. In the wintertime, when the water temperature decreases to 41° F. (5° C.) or lower, the starfish become much less active and many stop feeding. Consequently, destruction of oysters is greatest in the warmer months but control efforts may be carried out the year around.

Although found from Maine to Mexico, the starfish (Asterias forbesi) is rare north of Cape Ann. Although present in southern coastal waters, it is not considered to be a menace to the oyster industry of that section.

The starfish is much more susceptible to changes in salinity than the oyster. This is the controlling factor in Chesapeake Bay and in many sections of the Gulf coast. Starfish do not endure a salinity below 16 to 18 parts per thousand for more than a short time. They, therefore, do not penetrate the Chesapeake Bay much beyond Cape Charles and Norfolk (Loosanoff, 1945). There are a few other high-salinity areas in parts of New Jersey, Virginia, South Carolina, and Louisiana where oysters are grown, but the starfish population is controlled by other factors in these areas. In the open waters of Long Island Sound, however, since the salt content is normally above 25 parts per thousand, salinity is not an important environmental deterrent.

Galtsoff and Loosanoff (1939) made several surveys in different seasons at a large number of stations in Long Island Sound, Buzzards Bay, and Narragansett Bay to study the local geographic distribution of the starfish. Generally speaking, there was no evidence of marked seasonal changes in abundance, within the same year, nor of migration from one area to another. Heaviest concentrations were found where food was abundant, in the western end of the Sound, and in Buzzards Bay near New Bedford and Wareham at the head of the Bay. In Narragansett Bay, near Prudence Island, starfish were plentiful, but relatively few were found in Block Island Sound.

ABUNDANCE OF STARFISH

Starfish have been the subject of control measures by the oystermen of the New England area for most of the 100 years since the beginning of the cultivation of oysters there in 1845.

Among these men, it is common knowledge that starfish on the oyster beds show very large fluctuations in abundance from year to year. Many of these men are of the opinion that decreases in the number of starfish are due to the intensive control efforts that are instituted when it is realized that the numbers are on the increase, and conversely, that the periods of great abundance follow temporary relaxation of control efforts when few starfish are to be found. Migrations from uncultivated areas not subject to control measures are considered largely responsible for maintenance of the starfish population (Anon., 1945).

With the exceptions of a 30-year record by a company on Narragansett Bay and one of 7 years by a company in Connecticut, the oystermen do not have records of how many starfish are eliminated by these control efforts. Their primary interest is in the reduction of the number of starfish to the lowest practicable level. Burkenroad (1946) attempted to determine starfish abundance over a period of some 75 years by a study of trade journals, newspapers, and records of public commissions. Fluctuations in starfish abundance appear to have a definite periodic characteristic, with a range of intervals between the peaks of maximum abundance of 11 to 16 years. This information corroborates the limited data from company records that fluctuations in population are fairly uniform throughout the area involved. Based on Burkenroad's report also, the interesting hypothesis is advanced that the variation in numbers of starfish is due predominantly to natural causes, and is not markedly influenced by the control efforts of the oystermen or by the occasional State or Federal financed efforts toward local elimination. If fluctuation in abundance of the magnitude suggested above were proven, it would require careful consideration whether to recommend utilization, nominal control, or an attempt at complete eradication of starfish.

ECONOMIC ASPECTS OF STARFISH CONTROL

An accurate estimate of the damage caused the oyster industry by starfish is difficult to make since it should include not only the direct cost of control efforts, but also the potential value of young oysters killed and the value of marketable seed-stock and older oysters lost. No recent data are available on direct cost of control efforts, but with increased wages and operational costs, it is likely that the total amount spent for this purpose is more than \$500,000 annually.

The oystermen continue these costly controls through the years because they realize what would happen if the starfish were permitted to grow unchecked on the oyster beds.

A single medium sized starfish may kill as many as five one-year-old oysters a day (Anon., 1945). It is possible to calculate the potential loss if a conservative estimate is taken that 100 fair sized oysters are killed a season, and the average weight of a starfish in the Sound is 0.28 pound as estimated by Burkenroad. A bushel of 60 pounds will then contain, roughly, 2,000 starfish. Each bushel destroyed, therefore, represents perhaps 200,000 young oysters that may grow to market size. These would be worth about \$1,000 as one- or two-year-old seed-oysters.

The daily "take" of a vessel engaged in starfishing will vary widely with the type of gear used and the density of starfish on the area worked. Sweet (1946) states that control efforts are carried out even when the amount taken is as low as 10 pounds of starfish per hour per vessel or little more than a bushel per day. On the other hand, in seasons of abundance, the daily average yield may be 25 bushels per vessel per day with maximum yields of 50 to 100 bushels. The usual catch is about 6 to 10 bushels per day on cultivated beds.



Operating costs of a starfishing vessel have mounted rapidly since 1935. A minimum estimate would be \$50 daily when the larger oyster vessels are shifted to these operations. The maximum may be three times this estimate. Depending upon the abundance of starfish, from 5 to 20 or more craft may be used for control purposes. These costly control operations for a non-productive purpose are justified by the potential damage each bushel of starfish is capable of causing if the more than 2,000 starfish it contains are left to continue their depredations throughout the season.

METHODS OF CONTROL

Mopping, dredging, and liming are the methods of starfish control in most general use. Control by other chemical agents; such as, copper and zinc sulfate or chromium salts, has been studied, but none of these methods has proven practical (Galtsoff and Loosanoff, 1939).

Mopping is mostly used both because the mop causes little damage to the delicate seed-oysters and because it effectively and thoroughly cleans areas where few starfish are located. Dredging can be used to clean uncultivated areas free of oysters where the starfish population is very heavy. The regular oyster-dredging operations incidentally capture numerous starfish. These are killed with lime before the oysters are replanted. Liming can be used on either seed or "growing" oyster beds, the chief disadvantage of this method being the difficulty of distributing the lime in proper amounts over the desired areas.

The starfish mop, or tangle, is usually a home-made rig which does not follow any standard design. It is essentially a long bar to which are secured, at regular intervals, 6 to 12 short lengths of chain. Along each chain are tied the "mops," or bunches of string or twine. This outfit is slowly dragged over the bottom at the end of the dredge cable. The starfish become entangled in the mops, are unable to escape, and the mop is hauled up at intervals to remove the starfish.

Starfish may be hand-picked from the mops but the operation is slow and expensive because extra deck-hands are required. Hand-picking may be used on vessels

engaged in abundance-survey operations or on oyster vessels which do not have hot water tanks when pressed into starfish control during emergencies. Most of the seed-oyster companies operate one or more vessels exclusively for starfish control and these are generally equipped with long vats or tanks into which the whole mop frame may be dipped. These tanks are filled with water at a temperature of about 150° F. (66° C.). At this temperature, the starfish are not only killed, but are softened so that they are washed out of the mop as it is lowered for the next dragging operation. Two mops are used, one on each side of the boat, and only about two minutes are required for the hot-water dip. Thus, the mops are in use most of the time and a large area can be covered more effectively than with the dredge or hand-picked mop.

Lime has been found to kill starfish even when only a few small particles settle on the aboral surface. The chemical is only slightly soluble in water and is quite cheap and readily available. The lump lime may be shoveled over the boat rail to be disintegrated and dispersed as it settles to the bottom. Effective coverage in this manner is difficult, as some quantity may be carried away by tide and currents. Loosanoff and Engle (1942) developed an apparatus for distributing a lime suspension immediately over the bottom. A stream of water from a centrifugal pump picked up the fine lime and the suspension was forced through a hose line to a distributor pipe which was carried a short distance above the bottom on a pair of wheels. This apparatus permits even distribution with little loss to tide and currents, but its use has not been widely adopted because of the expense and difficulty of obtaining the required new equipment.

A fourth control method, the Flower suction dredge, utilized the principle of the vacuum cleaner. A wide funnel-shaped collector was carried on wheels at a short distance above the bottom. The distance could presumably be adjusted to permit removal of either light material only or almost anything loose, including mud and sand. A large centrifugal suction pump discharged this mixture into a rotating screen which separated the larger solid material and dumped it onto a conveyor. It was reported that the desired selectivity of bottom material was hard to obtain and that operating costs were excessively high. Its use would not be justified except in periods of maximum abundance of starfish.

There have been intermittent efforts over a period of years to find some use for starfish, interest in the subject being stimulated by recurring periods of abundance.

The benefits to be derived from the discovery of some economically practical or even profitable means of using starfish would be threefold:

- (1) The oystermen would receive some return for starfish brought in, and inasmuch as all are now discarded, anything received would cut control cost by that extent.
- (2) The creation of a market for starfish would, it may be assumed, lead to independent efforts towards their capture and to new sources of income for certain groups.
- (3) Theoretically, at least, there would be a reduction of the starfish population in the whole area to a point where the peaks of abundance would no longer occur. This event would, of course, simplify the control of starfish on the leased beds and a second, and probably even larger saving to the oystermen would result thereby.

To this end, the Fish and Wildlife Service undertook an investigation of some of the possibilities of starfish utilization. The information obtained in the course of this investigation will be reported in detail in other papers of a series on this subject.

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ECONOMIC REVIEW OF THE FISHERIES IN 1947 AND PROSPECTS FOR 1948

By Richard A. Kahn*

ECONOMIC REVIEW--1947

In 1947, the fishery industries contributed about 2.6 billion dollars, or 1.28 percent, to the national income, which was estimated at 203 billion dollars by the President's Council of Economic Advisers. Of this amount, about 275 millions were received by fishermen and boat owners for their catch, or about 0.14 percent of the national income. This percentage relationship was only slightly smaller than the percentage relationship of the number of fishermen engaged full time in commercial fishing to the total civilian labor force, which was 0.16 percent. About 97,000 full time fishermen were engaged in commercial fishing, while the total civilian labor force in 1947 was about 60,186,000. This relationship is similar to the relationship of the farmers' income to the national income and of the number of farmers to the total labor force. The income of the fishermen in 1947 was, on the average, about 15 percent higher than 1946, while the farmers' income was about 20 percent higher.

Prices for several species of fish showed considerable increase during the year. Pilchard prices increased from \$40 per ton in 1946 to \$60 by November 1947, an increase of 50 percent. Albacore tuna prices in California increased from \$390 per ton (1946 OPA ceiling) to \$410 in 1946 and to \$520 in 1947. Similar increases occurred in the price of Pacific Coast mackerel and the price for various items of salmon. In the important Bristol Bay region of Alaska, the price of red salmon to the fishermen increased about 12½ percent over the previous year. The increase of the prices of these species, which are mainly used for canning, noticeably influenced the fish price development in 1947 and more than balanced some price decreases of fresh and frozen fish; such as rockfish and sole, in the early part of 1947. The main reasons for the price increases of some of the species used for canning were the lack of abundance in some cases and the greatly increased demand for canned fish. Pilchards, for example, were caught only in one-fourth the quantity of the 1937-40 average, or one-half of 1945-46 season. The salmon catch in 1947 was about 10 percent below the average 1937-40.

As in the case of agricultural products, the price of fresh and frozen fish showed noticeable advance during June 1947. According to the Bureau of Labor Statistics, U. S. Department of Labor, the Retail Price Index for fresh and frozen fish averaged 240.5 points in 1946. It averaged 225.1 points in June 1947, then



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1/ The Agricultural Situation, U. S. Department of Agriculture, December 1947.

increased in December 1947 to 260.7 points.^{2/} The price of large haddock, as landed, in Boston, Mass., was 10.55 cents per pound, on the average, for 1946. It averaged 6.76 cents per pound in June 1947, and then increased to 12 cents in December 1947. This price decline in mid-1947 was greater than the seasonal fluctuation usually encountered at that time of the year.

The reason for the price decrease in the first part of 1947 was that, during the first half of the year, competitive foods made heavy inroads in fish-food consumption. Somewhat of an influence was also the high level of cold storage holdings in early 1947 which resulted in a heavier withdrawal in 1947 as compared to 1946. The decrease of cold storage inventories was 41.4 percent from January 1, to June 1947, while it was 30.7 percent during the same period in 1946. The heavy offerings of frozen fish, occasionally below cost, contributed to price decreases in the early part of 1947.

Canned fish prices were riding high during all of 1947. The Retail Price Index of the Bureau of Labor Statistics shows, as far as salmon (pink) is concerned, an average of 198.2 points in 1946, increasing constantly month by month to 391.0 in December 1947.^{2/} The price increase resulted from not only the higher prices of the raw materials and the short production in some items, but also from the effect of larger family incomes and the willingness of the consumer to pay the prices for the more favored grades of canned fish.

There exists a definite relationship between the demand for fish and the demand for competing foods which are eaten on certain days of the week or the year because of religious customs. Foods competing with fish and shellfish on these days include cereals, noodles, eggs, and cheese. Increased grain prices had an immediate effect on fish prices owing to the interrelation just mentioned.

PROSPECTS FOR 1948

Considering the outlook for 1948, the market for fish and fishery products should remain strong for another year. The prices of fish and fishery products will probably average about the same as the prices of 1947, and the incomes of fishermen and the members of the fishery industries will probably be near those of 1947. This forecast closely parallels the outlook for agriculture for 1948, which was published by O. O. Stine in The Agricultural Situation, December 1947.

A few specific situations and developments which will influence prices and markets in 1948 to some extent are:

1. Domestic demand for fish and fishery products will continue to be brisk. This demand is not only based on and influenced by the natural increase of the population, it is also influenced by the development of new markets.

Recent surveys show that during the last 10 years, inland markets have undergone noticeable changes. In about one-fourth of 52 cities surveyed, fresh local fish, which were the preferred species in 1936, have been replaced by frozen fish transported into the respective localities from more distant areas. This means not only a change of the species of fish on the tables of those who live in the respective areas, but it means more fish consumption as a whole because frozen fish (mostly frozen groundfish) are available in larger quantities, and more constantly during the year than the most local varieties of fresh fish, formerly preferred.

^{2/}See "Retail Food Prices by Cities," U. S. Dept. of Labor, January 1946 to December 1947.

Recent reports show that in certain inland areas insufficient frozen fish is available to meet the demand, and in some instances, prices increased sharply because of the demand.

Whether domestic production of fresh fish can or will be increased, is a matter of speculation as to the availability of the fish as well as relations between management and labor. If management-labor relations, which in 1947 were badly disturbed on both coasts, improve in 1948, increased production should ease a tight market situation, such as existed at the beginning of the current year.

2. The demand of the urban population for certain species; such as, shrimp, oysters, and lobsters, will remain high in 1948, since the demand for these products has increased because of the greatly enlarged higher income groups who can afford to buy them. It can be expected that these urban income groups will continue to have a high income in 1948, because most of the groups are occupied in trades (automobile, building, railroad transportation equipment, and heavy machinery) in which a great demand probably will continue in 1948.

3. It also can be expected that exports of fish and fishery products will be less in 1948. Exports were encouraged by the recent lowering of some tariff barriers (for example, the tariff reduction for certain canned salmon in Great Britain). However, the lack of dollar funds in foreign countries will limit the export of fishery products.

It also can be expected that the foreign fisheries will recover rapidly, and that in 1949 and 1950 our export trade in fish and fishery products probably will be made more difficult due to the increased offerings of domestic production in the 16 countries which are expected to participate in the European Recovery Program.

Imports in this country are expected to continue on a high level in 1948. These imports are dominated by groundfish fillets, mostly from Canada, Newfoundland, and Iceland, and by fresh-water fish and sea herring, principally from Canada. Other items heavily imported are salt cod, canned sardines, shrimp, lobsters, and fish oils. Imports of higher priced products probably will not affect the price level of American products. Either they will be going to specific markets in which little domestic competition exists or the production costs will have increased in foreign countries to such an extent that little danger of dumping exists.

4. Inventories of frozen fish in the beginning of 1948 were lower than in 1947, which factor indicates a good policy applied by the members of the trade. This policy should be continued and inventories should be further lowered at the beginning of 1949 as compared to January 1948. This advice as to inventories is based on the consideration of some weak factors in our economy:

(a) Varying policies of tightening or easing bank credit create uncertainty. This factor is limiting somewhat the processing of fish and fishery products for delayed deliveries or for storing.

(b) Possible devaluation of foreign currencies has been experienced recently in France must be considered. If such devaluations should be followed in other countries or should reoccur in countries which already have had devaluations, our export might be handicapped or come to a complete standstill.

(c) Certain shortages of raw materials which may not be freely accessible will affect industrial production.

(d) Spot shortages of manpower, especially the lack of skilled laborers, may prevent the full output of industrial products for which there is a demand.

There are signs that, after 1948, a period of price and production declines may begin. The economic experts who worked on the European Recovery Program indicate in their charts that, in 1949, foreign production will increase sharply and in 1950 probably will result in increased imports. These economists say that in 1950 there probably will be overproduction in agricultural output as well as in certain industrial production. A policy of saving during 1948, and of reduced inventories, will help the fishermen and the members of the fishery industries to cushion any possible future decline in economic prosperity.



VALUE OF FISHERY PRODUCTS AT
VARIOUS LEVELS OF PRODUCTION
AND DISTRIBUTION IN THE UNITED STATES
1939-1946

PRODUCTION OR DISTRIBUTION LEVEL

YEAR	EX-VESSEL DOLLARS	PROCESSOR DOLLARS	WHOLESALE DOLLARS	RETAIL DOLLARS
1939	965,320,000	188,237,000	245,480,000	316,431,000
1940	99,000,000	198,200,000	255,600,000	327,400,000
1941	134,172,000	261,635,000	341,199,000	439,815,000
1942	170,338,000	332,159,000	433,169,000	558,367,000
1943	204,000,000	397,759,000	518,711,000	668,692,000
1944	207,300,000	404,200,000	527,100,000	679,500,000
1945	230,941,000	450,335,000	587,283,000	757,025,000
1946	253,000,000	528,105,000	688,697,000	887,791,000



RESEARCH

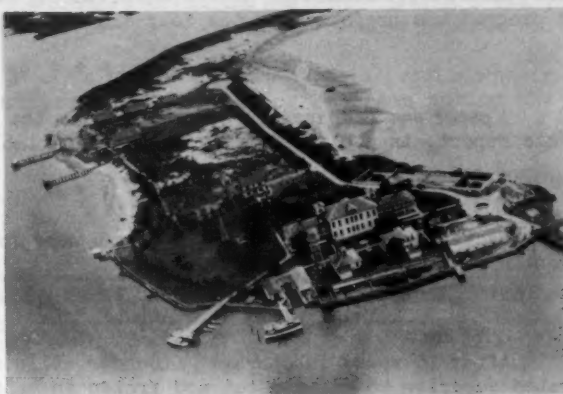
IN SERVICE LABORATORIES

NOVEMBER 1947 Beaufort, N. C.

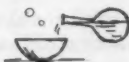
Conferences were held with officials of the Coast and Geodetic Survey and the Coast Guard to discuss a practical procedure for locating and marking sunken vessels and other bottom obstructions off the Maryland, Virginia, and North Carolina coasts which have caused destruction of fishing gear of boats operating in that area.

* * *

Flexible moulds for making casts of a sail fish, a jumping mullet, and the largest menhaden on record were prepared.



IN THE FOREGROUND
U.S. FISHERIES LABORATORY, BEAUFORT, N. C.



College Park, Md.

The content of the amino acids arginine and lysine in commercial Alaska salmon meal was determined.

* * *

A fishery exhibit was prepared for showing at the National School Food Service Directors' Convention held in Dallas, Texas, on November 13, 14, and 15. Two fish cookery demonstrations were given at the University of Mississippi.

* * *

Packs utilizing chum salmon, whiting, and mackerel were prepared in connection with the School Lunch Program sandwich spread project.

Ketchikan, Alaska

The progress report presenting most of the data secured in one year's survey of the commercially valuable clam beaches in Southeastern Alaska is nearing completion. Included are a summary of the present situation in the clam canning industry, the method of testing the clams, and a table showing the mouse units of toxin in clams collected from various beaches.



Seattle, Wash.

Some time was spent in assisting the Pacific Exploration Company in modifying the winch design aboard the Alaska and preparing data sheets for the vessel captains. A program was prepared for the four RFC fishing vessels.

* * *

A paper was prepared on suggestions for the operation of tuna receiving ships. This report, in published form, will be available in the near future.

* * *

Packaged samples of frozen king crab were found to be satisfactory after three months of storage.

* * *

After 10 weeks in storage, flounder fillets cut from frozen whole fish were rated superior to fillets cut and frozen in cans.

* * *

Samples of meals prepared from whole salmon waste and salmon viscera were prepared and shipped to a number of laboratories requesting samples for experimental work.

* * *

A series of cooperative tests with fur farmers in the Seattle area were begun in which salmon waste oils are being used. A talk was given to a group of fur farmers on use of fish and fish meal in the diet of fur-bearing animals.

* * *

Opportunities and nature of work in the field of fishery technology were described in a talk given before a group of university students.





TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

A total of 69 vessels of 5 net tons and over, received their first documents as fishing craft during November 1947, compared with 88 in the same month the previous year. The State of Louisiana led with 12 vessels documented during the month, followed by California with 8 vessels, and Texas and Florida with 6 each, according to information released by the Bureau of Customs, Treasury Department.

During the first 11 months of 1947, a total of 1,225 vessels received their first documents as fishing craft, compared with 1,018 for the same period the previous year.

During the first 11 months of 1947, the State of Washington led in the documentation of fishing craft with a total of 208. Other leading States were California with 143, Louisiana with 129, and Florida with 104.

Vessels Obtaining Their First Documents as Fishing Craft

Section	November		Eleven mos. ending with November	
	1947	1946	1947	1946
	Number	Number	Number	Number
New England	1	8	70	73
Middle Atlantic	5	10	67	68
Chesapeake Bay	6	9	90	66
South Atlantic and Gulf	35	36	456	335
Pacific Coast	14	16	397	356
Great Lakes	2	5	71	69
Alaska	5	1	41	24
Hawaii	1	3	21	14
Unknown	-	-	12	13
Total	69	88	1,225	1,018

Note: Vessels documented by the Bureau of the Customs are craft of 5 net tons and over.



Utilization of Alaskan Salmon Waste

Technical and economic problems connected with the utilization of the salmon waste of Alaskan canneries are discussed in a research report released by the Office of Technical Services, Department of Commerce.

Current practice of Alaskan canneries is to discard the head, tail, fins, and viscera (about one-third of the weight of the salmon) by hauling these parts out to sea for dumping at considerable expense. Total annual waste is estimated at about 100,000,000 pounds.

The report describes the results (to January 1948) of a current study of the utilization of salmon waste to produce proteins, amino acids, enzymes, hormones,

and other products for the pharmaceutical and chemical industries. The research is being carried out under a contract negotiated in 1947 between the OTS Industrial Research and Development Division and the Alaska Fisheries Experimental Commission, Ketchikan, Alaska. The U. S. Fish and Wildlife Service has cooperated by making its Fishery Technological Laboratory, Seattle, Wash., available for the study. Widespread interest in the research has prompted the release of Part I of the report before completion of the study. According to Ely C. Hutchinson, IRDD Director, "This is the first coordinated study of the problem of the utilization of fish waste."

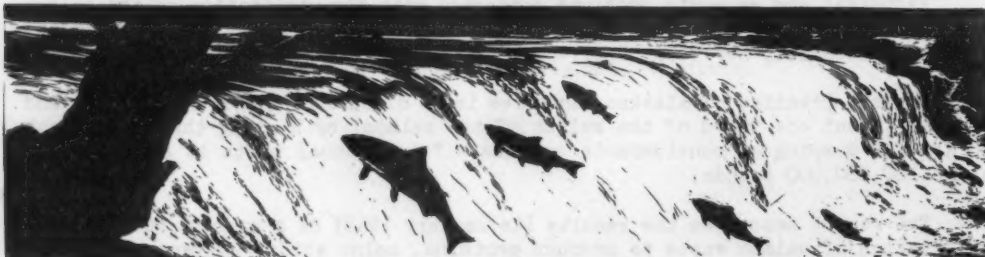
The report reveals that the utilization of salmon waste in Alaska is handicapped by several factors: the location of canneries at isolated spots, precipitous terrain making it difficult to expand installations, the extremely short canning season with a glut occurring at the 10-day peak of the season, high operating costs, limited transportation facilities, the perishability of the waste, and the employment of large crews of "outside" help.

However, G. Ivor Jones and Edward J. Carrigan, biochemists of the Seattle Technological Laboratory, and authors of part of the report, believe many possibilities exist for producing chemical and pharmaceutical products from the waste.

Discussing protein production, the biochemists state that a substantial amount of protein is to be found in the head, collar, and tail sections of the salmon. The roe is a good source of histone and the milt contains a high percentage of protamine. Other proteins with special properties are found in the digestive tract, liver, heart, and fins. The problem of sorting component parts of the waste for processing into special products could probably be solved, they suggest, by mechanical means. Even now the "iron chink" system for butchering the fish could be slightly altered to separate the head, collar, and tails from the rest of the waste. But manufacturing difficulties are more serious. If the processing were done on the spot, tremendous quantities would have to be handled in the 4-6 weeks' canning season. In some places, there is barely enough fresh water to handle present operations. Frequently, the terrain leaves but little space for plant expansion. If processed elsewhere, transportation would present difficulties.

Nevertheless, many of the problems can perhaps be solved by further study, the authors suggest. "An operation designed to prepare a fat-free, semi-purified protein and simultaneously recover the valuable fat fractions of salmon eggs seems to offer good economic possibilities," they say. Milt could be easily separated from the waste to produce protamine insulin should the market for this product expand.

In the case of protein hydrolysates, used in special protein diets and in the preparation of microbiological culture media, the market already appears satu-



rated with different preparations, the report states. "It seems doubtful whether still another one prepared from salmon waste could be successfully marketed."

Difficulties to be encountered in extracting and isolating amino acids from salmon waste can only be conjectured at present, the authors say. But, they add, "It seems entirely possible that commercial methods of extraction and isolation now being used with other protein sources could be readily adapted to the processing of salmon waste proteins. . . ." Salmon milt yields a simple protein "salmine," reported to contain about 88 percent arginine. If the market for this amino acid increased greatly, its production from salmon milt would be economically possible. However, a precise determination of the yields of specific amino acids is necessary before definite conclusions concerning this type of utilization can be reached, they conclude.

Exploitation of the fats and lipids in salmon waste for production of unsaturated fats, lecithin, and cholesterol--appears to have good possibilities though attendant problems require further study. Since salmon (and other fish) oils are unique in having long chain highly unsaturated fatty acids, additional research might turn up special markets for them. Lecithin, found in salmon eggs, is used in many industries. The practicability of recovering cholesterol from the egg oil depends on whether the cholesterol content is as high as reported, and whether it could be produced competitively with processes using wool fat or spinal cords.



The digestive tract of salmon is a good source of common hydrolytic or digestive enzymes. However, installation of a chemical processing plant in Alaska would be expensive. It would appear more economical to prepare crude concentrates in Alaska for refining in the United States.

Further research may show the advisability of utilizing the waste for production of insulin, sex hormones, and numerous other miscellaneous compounds, the report states. "It becomes increasingly obvious that full and efficient utilization of salmon waste rests upon the instigation of a comprehensive and long range research program in order to fully ascertain the possibilities of lesser known constituents," these authors believe.

In general, it will be necessary to "find a product or several products which can be prepared from the waste with a high enough selling price. . . and to develop some method for handling the huge glut of waste, presumably by finding some suitable preservation technique whereby processing can be carried out over a longer period of time. . .," the report states.

Messrs. Jones and Carrigan base their analysis of the technology and economics of salmon waste utilization on an intensive survey of the literature on the subject, (over 600 items), and on interviews with researchers and business executives in leading pharmaceutical companies, medical research centers, and universities.

The report also contains two preliminary technical papers describing special phases of the research.

Charles Butler and David Miyauchi, chemists of the Seattle Technological Laboratory, report on their study of the preparation of vitamin oils from salmon

waste by the alkali digestion process. "It may be stated that the (alkali digestion) process can be utilized to recover the oils from the waste, but the experiments conducted were not sufficiently numerous . . . to warrant conclusive statements regarding the potential supply of vitamin A oils that could be obtained from Alaska cannery waste." The technical details of the research on this subject accomplished thus far are fully described.

The report contains an account of a biological assay of the nutritional value of salmon waste for feeding hatchery fish, prepared by Roger E. Burrows, aquatic biologist, U. S. Fish and Wildlife Service and Neva L. Karrick, chemist, Alaska Fisheries Experimental Commission. The demand for hatchery bred fish and food to feed them has increased tremendously in recent years, they state. The Alaskan salmon waste is a huge potential source of fish food providing it can be preserved for transport and storage. Feeding tests using the frozen viscera of Columbia River salmon have indicated that this food develops better growth and results in lower fish mortality than some other foods currently used. This phase of the research, however, is not complete and will be further discussed in Part II of the report.

Part II will also report findings of research to prepare an edible salmon oil for human consumption and will contain further details on the development of new products from salmon waste.

Mimeographed copies of the report (PB-85171; Utilization of Alaskan Salmon Cannery Waste; 89 pages) sell for \$2. Orders for the report should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order, payable to the Treasurer of the United States.



U. S.-Canadian Provisional Seal Agreement Signed

The United States and Canada, by an exchange of notes dated December 26, 1947, have provided for the continuance of the present provisional fur seal agreement between the two countries until a permanent convention can be arranged for the protection of the fur seal herd of the North Pacific, according to a Department of State release of January 6.



The original sealing convention for the protection and preservation of the fur seal herd of the North Pacific Ocean was signed in 1911 by the United States, Great Britain, Japan, and Russia. In October 1941, this convention was abrogated by Japan. During the war, the Governments of Canada and the United States felt it advisable that the two countries should continue the protection of the herd. They therefore entered into a provisional agreement for the duration of the emergency and 12 months thereafter in order to carry on the fur seal conservation program during the war.

The fur seal conservation program was designed to rehabilitate the stock of fur seals in the North Pacific, which had become seriously depleted by the practice of ruthless pelagic sealing. The original convention was intended to rebuild the herd, primarily by the prohibition of pelagic sealing. In 1912, the first year that the convention was in effect, the size of the Pribilof Islands herd was about 216,000; by sound conservation and management practices the herd has now increased to over 3,600,000, according to the annual census taken in August 1947. The sealing operations in these Islands are administered by the Fish and Wildlife Service of the Department of the Interior. The herd is estimated to be worth in excess of \$100,000,000, and the fall 1947 semi-annual auction of fur seal skins yielded gross proceeds to the Federal Government of over \$1,470,000.

Since the U. S. Government assumed direct control over the fur seal herd, a total of 1,360,000 skins have been taken. The United States has already received net proceeds in excess of \$13,000,000 from the sale of its share of these skins.



Personnel Changes--Division of Commercial Fisheries

The Division of Commercial Fisheries announced that effective about April 15 there will be several personnel changes in its Washington staff.

Fred F. Johnson, who was first appointed in 1920 and has been employed in the Division continuously since then except for several years in private industry and four years in active Naval service, will transfer to the Headquarters of the Fish and Wildlife Service's Region 1 at Portland, Oregon, as one of the two Assistant Regional Directors. Mr. Johnson's work there will be particularly concerned with administration of fish cultural activities, river basin development projects, and other fisheries work in this important fish-producing region which embraces the States of California, Oregon, Washington, Nevada, Idaho, and Montana. Mr. Johnson has been Assistant Chief of the Division of Commercial Fisheries since 1935; and has also held the positions of Chief, Statistical Section and Chief, Statistical and Market News Section.



* * *

R. T. Whiteleather, who is now Chief of the Educational Section, will be made Assistant Chief of the Division, the position vacated by Mr. Johnson. Mr.



Whiteleather is a graduate of the Fisheries School at the University of Washington, having obtained a degree in fisheries in 1935. After his graduation he became engaged in stream survey work in connection with the Federal Government's Salmon Rehabilitation Program on the Columbia River, and later worked in Alaska on the Herring Investigations in Kodiak and Prince William Sound areas. After leaving the Pacific Coast in 1938, Mr. Whiteleather spent considerable time in fisheries statistical work in the States on the Atlantic Coast. More recently, he was engaged for four years in exploratory fishing operations in the British West Indies, Puerto Rico, and the Virgin Islands. During 1945 and a part of 1946, he was in charge of the Division's Fishery Market News Office in New York City.

In May 1946, he was brought to Washington to organize the new Educational Section in the Division and has supervised its activities since that time.

* * *



Donald Y. Aska, now serving as Assistant Chief of the Statistical Section, will be appointed Chief of the Educational Section succeeding Mr. Whiteleather.

Mr. Aska is a graduate of the University of Washington, where he attended the Fisheries School, and has been employed by the Service since 1938, at which time he was assigned to fishery statistical field work in the Atlantic Coast States. In 1942, he was detailed to the Statistical Section in the Washington office, later accompanying the administrative offices of the Service to Chicago. During the period 1943 to 1945, Mr. Aska served with the Army Corps of Engineers both in this country and in the European Theatre. Since his return from military furlough in 1945, he has been serving as Assistant Chief of the Statistical Section.



Day Appointed to Salmon Commission

The Secretary of State announced on January 5 that the President has designated Mr. Albert M. Day, Director of the Fish and Wildlife Service of the Department of the Interior, as a United States member of the International Pacific Salmon Fisheries Commission, United States and Canada, to fill the position left vacant by the death of Mr. Fred J. Foster. The other United States members of the Commission are Messrs. Edward W. Allen and Milo Moore, both of Seattle, Wash. Mr. Day will receive no compensation for his work as a member of the Commission, and he will maintain his position as Director of the Fish and Wildlife Service.

The International Pacific Salmon Fisheries Commission functions under the Convention between the United States and Canada signed at Washington on May 26, 1930, for the protection, preservation, and extension of the sockeye salmon fishery of the Fraser River system.



Dr. Kask to Head FAO Fisheries Branch

The Food and Agriculture Organization announced on January 15, 1948, that Dr. John L. Kask of the United States of America has been appointed to head the Biological Branch of the FAO Fisheries Division. Dr. Kask, at present Curator of Aquatic Biology at the California Academy of Sciences, San Francisco (USA), is expected to take up his duties with FAO on January 16. Dr. Kask already has considerable experience in the international aspects of fisheries problems. From 1928 to 1938 he was Associate Scientist of the International Fisheries Commission, (USA and Canada). For the next six years, Dr. Kask served as Assistant Director of the International Pacific Salmon Fisheries Commission. He also spent two years in Japan as Assistant Chief of the Fisheries Division on the staff of the Supreme Commander for Allied Powers.

Dr. Kask's immediate work at FAO will be to organize Regional Fisheries Councils. Fishery conservation and management problems on the high seas are international in character, but because these problems differ widely in the many areas involved, Fisheries Councils are being established by FAO on a regional basis to assist governments to develop fully their natural fisheries resources. Specific problems to be studied include distribution of species, seasonal variations in abundance, the effect of fishing operations on numbers, and effective methods of propagation, stocking, and control of disease and pollution.

The FAO Geneva Conference last summer recommended the setting up of these Regional Councils for the Northwest Atlantic, Southwest Pacific and Indian Ocean, Mediterranean Sea and contiguous waters, Northeast Pacific, Southeast Pacific, Western South Atlantic, Eastern South Atlantic, and Indian Ocean (African area). Thirteen countries bordering in European waters, comprising the Northeastern Atlantic, North Sea, and the Baltic Sea, fall within the scope of the Permanent International Council for the Exploration of the Sea, established in 1899 with headquarters at Copenhagen, Denmark.

FAO will concentrate on establishing Councils in regions where no such service is already in existence. Preliminary work on the establishment of Regional Councils in the Indo-Pacific area will begin at the FAO Fisheries Conference to be held in the Philippine Islands late in February 1948.



Wholesale and Retail Prices

Reversing the upward movement of the previous month, average primary wholesale food prices showed a decline of 2.1 percent from September 20 to October 18 and a drop of 0.3 percent from October 18 to November 15, according to the Bureau of Labor Statistics, U. S. Department of Labor. Wholesale canned salmon and cured cod did not follow the general trend and showed gains during October and November.

Wholesale and Retail Prices

Item	Unit	Percentage change from--			Percentage change from--		
Wholesale: (1926 = 100)		10/18/47	9/20/47	10/19/46	11/15/47	10/18/47	11/16/46
All commodities	Index No.	157.9	-0.1	+16.9	158.5	+0.4	+16.7
Foods	do	178.5	-2.1	+ 1.7	178.0	-0.3	+ 8.5
Fish:		10/47	9/47	10/46	11/47	10/47	11/46
Canned salmon, Seattle:							
Pink, No. 1, Tall	\$ per doz. cans	4.710	+4.0	+82.0	4.894	+3.9	+53.5
Red, No. 1, Tall	do	6.125	+8.4	+29.5	6.279	+2.5	+17.1
Cod, cured, large shore,							
Gloucester, Mass.	\$ per 100 lbs.	14.250	+5.6	+ 2.5	14.500	+1.8	0
Herring, pickled, N. Y.	¢ per lb.	12.0	0	0	12.0	0	0
Salmon, Alaska, smoked, N. Y.	do	35.0	0	0	35.0	0	0
Retail: (1935-39 = 100)		10/15/47	9/15/47	10/15/46	11/15/47	10/15/47	11/15/46
All foods	Index No.	201.6	-0.9	+12.0	202.7	+0.5	+ 8.0
Fish:							
Fresh and canned	do	286.5	+3.9	+14.7	302.4	+5.5	+14.1
Canned salmon:							
Pink	\$ per lb. can	48.0	+6.9	+99.2	50.7	+5.6	+63.0

The commodity prices index in primary markets rose to 158.5 percent of the 1926 average as of November 15, which is a new postwar high, 16.7 percent above a year earlier, and 40.6 percent higher than the end of June 1946.

Retail food prices in large cities followed the wholesale trend in October and declined 0.9 percent compared with the previous month, but in November the reverse was true and an increase of 0.5 percent took place when compared with October. Compared with October and November a year earlier, retail food prices increased 12 percent and 8 percent, respectively.

Retail prices of fresh and canned fish in October gained 3.9 percent over September, and an additional increase of 5.5 percent between October and November. In comparison with October and November a year previous, there were gains of 14.7 percent and 14.1 percent, respectively. Canned pink salmon followed the same general trend as fresh and canned fish.



COD--THE BEEF OF THE SEA

Reams have been written about various fish, both from a sporting and nutritional standpoint, but seldom do you see anything regarding that illustrious species of fish, the cod, along with the immediate members of its family, the haddock, pollock, hake, and cusk, all popularly designated as "groundfish." The cod has been termed by some, "The Beef of the Sea." From a nutritional standpoint it might well deserve this title since it contains an amount of protein pound for pound equivalent to beef, besides essential minerals, vitamins, and fat.



As cattle or beef are perhaps the greatest source of meat from our land producing areas, so was the cod our greatest source of food from the sea for many years. Granted that it does not hold this position now with salmon, tuna, rosefish, and several other species being caught in greater volume today, but historical books and pamphlets indicate that the fishing industry of the United States developed around the cod.

--Fishery Leaflet 269



Australia

FISH SCALER: Faced with the unpleasant prospects of scaling, single-handed, a large consignment of small fish, a cafe proprietor of Adelaide decided to try scaling some in his potato peeler, according to the Australian Fisheries Newsletter, December 1947. He was delighted to find that the machine, instead of harming his fish, scaled perfectly, in a few minutes, a batch that would have occupied almost one tedious hour of his time.

An electrical engineer of Adelaide has developed a modification of the potato peeler capable of scaling large fish. Today most fish in South Australia are mechanically scaled by one or other of these types of machines. Not only has the drudgery been removed, but speed in handling consignments has resulted also. For instance, one man operating the scaler easily keeps pace with 10 to 12 filleters. Eleven fish filleting plants and one cannery, using scalers, are now operating at South Australian ports.



Belgium

LIFTS CANNED FISH REGULATION: By Decree appearing in the Moniteur Belge of January 4, 1948, the Royal Decree of August 9, 1939, requiring the marking of country of origin on canned fish was abrogated, according to a U. S. Embassy airmail from Brussels, Belgium, on January 5.

American exporters of canned fish had protested against the enforcement of the Belgian requirement that the country of origin be marked on imported canned fish. Following these protests and representations by the Embassy, the Belgian Government decided to discontinue this requirement.



Germany

ICELAND HERRING TO GERMANY: Negotiations for the purchase of Faxa Bay herring from Iceland have been successfully concluded, according to a December 18 report by the Fisheries Bipartite Control Group in Hamburg. Transport of these herring to Germany will be undertaken by German trawlers which will call at Reykjavik for cargoes. So far, 6 trawlers have commenced operating this scheme, and at the time of writing, the majority of these are just arriving in Iceland. Catches of Faxa Bay herring are still reported as being good, and there seems no doubt that all the vessels concerned will be able to load a full cargo. If the venture is a success, further numbers of trawlers will be diverted for this purpose.

Iceland

FISHERIES SALES: Contracts for the sale of 3,000 tons of herring fish meal to Denmark, and 5,000 tons to the United States have just been concluded, according



to the American Legation, Reykjavik, Iceland. The latter deal is of especial importance as it will provide Iceland with badly needed dollar exchange at a time when dollar reserves have reached an all-time low, and also west-bound cargo for vessels shortly to sail for New York. With the dollar shortage, instructions have just been issued to exporters of cod liver oil forbidding them to sell for any currency other than dollars. This means in effect that the United States should receive most of the 1948 production (estimated at 8,000 to 9,000 tons) unless Russia, which in 1947 acquired 40 percent of the total, is willing to buy for dollars.

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HERRING FISHERIES: Since the beginning of the winter herring fisheries in November, over 80,000 tons had been caught by the end of the year, according to a report of the American Legation in Reykjavik, Iceland. As most of this fish is being processed, some 10,000 tons of herring oil should be produced, which equals half of the summer production. According to the latest measurements, the fat content of the herring caught in Hvalfjordur amounts to 15.9 percent, while that of the fish from the Sounds varies between 12 percent and 13 percent.

The chartering of foreign vessels for the transportation of the herring to Siglufjordur has already cost the Government some \$460,000.

As a partial solution to the problem of processing the fish caught off the west coast, the Government was recently authorized to buy a ship and alter it for the processing of 1,350 tons of herring a day. (It is contemplated that the S. S. Lagarfoss may be used for this purpose.) The Government will also construct herring oil tanks, store houses, and other installations on Faxa Bay (situated off the southwest coast). It is estimated that these operations will cost around \$2,150,000.



Inter-American

CONFERENCE AT DENVER, COLORADO: The Department of State announced on January 20 that the First Inter-American Conference on the Conservation of Renewable Natural Resources is scheduled to be held at Denver, Colorado, from September 7 to 20, 1948. After many other sites had been considered, the Governing Board of the Pan American Union and the Department of State decided to hold the Conference at Denver. The presence of many conservation projects in the surrounding territory was one of the factors contributing to the selection of Denver as the site. The Conference is being held pursuant to a resolution adopted at the Third Inter-American Conference on Agriculture held at Caracas, Venezuela, in October 1945.

The Conservation Conference, the first international meeting of its kind, will bring together Delegates from the American Republics to consider the develop-

ment and use on a sound scientific basis, of the renewable natural resources of the Hemisphere. It is anticipated that leading Government officials, scientists, and other interested groups from the entire Hemisphere will attend.

Among the problems to be discussed will be those arising out of deforestation, soil erosion, overgrazing, fish and wildlife decimation, floods, and failing water supplies. These problems are yearly growing more serious throughout the Hemisphere because of inadequate conservation practices, mounting populations, and attempts to raise living standards. They are of world-wide significance because of the increasing needs of Europe and Asia.

Warren Kelchner, Chief of the Division of International Conferences, Department of State, has been appointed Executive Vice President of the Conference, and William Vogt, Chief of the Conservation Section of the Pan American Union, Secretary General.



Japan

JAPAN EXPORTS AGAR-AGAR: Natural Resources Section of SCAP has concurred on the export from Japan to the United States of 12 tons of gelidium-bearing seaweed from which agar-agar is made. This shipment, the first of its kind, is experimental in nature. Information on the method of testing the weed for gelidium content and determining a price is not yet available.

* * * * *

JAPANESE PRODUCTS OFFERED FOR EXPORT: The following items are among those that appear on a list of Japanese products offered for export released by the Office of International Trade, U. S. Department of Commerce.

	Unit	Est. Production			Unit	Est. Production	
		Jan.-Mar. 1948				Jan.-Mar. 1948	
Agar Agar	lb.	570,000		Dried abalone	MT	60	
Fish livers	MT	9		" cuttlefish	"	450	
Fish Liver Oil:				" oysters	"	48	
Vitamin A	K	10,440		" shark fins	"	72	
" D	K	4,680		Fishing gut, artifi-			
Canned crabmeat	c/s	1,000		cial ..	lb.	45,000	
" oysters(smoked)				" jigs & lures ...	Pc.	90,000	
in oil	"	2,500		Bamboo poles, tuna .	"	114,000	
" sardines in oil }				MT - metric tons			
" " (pepper) }				K - kilograms			
" " tomato }	"	75,000		c/s- cases			
" mackerel in oil }				Pc.- pieces			

Among those commodities which are in limited production or may be produced on special order are listed "fishing boats."

For further information, consult with the local office of the Bureau of Foreign and Domestic Commerce.

* * * * *

SPONGE CULTURE: Experiments in sponge culture in the South Pacific Islands were started by the Japanese at Ponape in 1927 and ended at Ailinglapalap Atoll in the Marshalls in 1943, according to information collected by the Natural Resources Section of SCAP. Three methods were used:

1. Attachment of sponges to aluminum wire loops set in concrete plates and planted on the bottom.
2. Rafts of bamboo, from which sponges were suspended.
3. The bottle float method.

The first method was found unsatisfactory because the heavy discs settled into the sandy bottom of the sea, smothering the sponges. The raft method was successful, but wind and tide action caused injury to the sponges. The bottle float method was the most successful. Here a string of sponges strung on thin coconut palm rope was anchored to a bottom rock and suspended vertically by a bottle float which was about 18 inches below the surface of the ocean at low tide.



Plantings at Ailinglapalap were successful. The Japanese, however, as a result of their studies in the ex-mandated area believe that the small island of Manoric in the Ralick chain of the Marshalls is the ideal place in the South Pacific for artificial sponge culture. They estimate that a crop of 18,000,000 sponges could be successfully produced there. The two species of sponges used were the sheepswool and the velvet, both high quality sponges of good commercial value.



Mexico

FISHERY LAW: The President of Mexico issued, on December 31, 1947, a Decree setting forth various regulations for the fisheries. It is in 70 articles, divided into 9 chapters entitled: "Fishing in General," "Fishing Activities," "Fishing Authorizations," "Commercial Fishing by Cooperative Societies," "Fishing Conducted by Foreign Boats in Marine Territorial Waters," "Fishery Control," "Obligations and Restrictions upon Persons Engaged in Fishing," "Obligations of Third Parties," and "Penalties."

A translation of this Decree has been made and issued as Fishery Leaflet 283 and may be obtained free by writing to the U.S. Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.

* * * * *

FISHERY EXPORT DUTIES: There follows a Decree establishing export duties published November 27, 1947, in the Mexican Diario Oficial. A second Decree, published December 31, made additions and corrections to the Decree published November 27. Excerpts of the original Decree relating to fishery products, including the additions and corrections published December 31, follow.

The translation was made by the Mexican Fishery Mission of the U. S. Fish and Wildlife Service.

D E C R E E :

"The Congress of the United Mexican States decrees:

GENERAL EXPORT TAX TARIFF

Article 1. The Export Tax shall be applicable in accordance with the following tariff:

Nomenclature	Unit	R a t e	
		Specific	Ad valorem
Animal Matter in Natural State or Simply Prepared			
Live Animals			
Fish, Crustaceans, Molluscs and Cetaceans:			
Clams	G.K. ^{1/}	\$0.03	plus 5%
Lobster	G.K.	0.10	plus 5%
Oysters in the shell	G.K.	0.01	plus 5%
Sea elephant and seal	Head	100.00	-
Sea lion	Head	100.00	-
Fishes	G.F.	0.03	plus 5%
Crustaceans, molluscs and cetaceans, un- specified	G.F.	0.03	plus 5%
Other Animals:			
Tortoise-shell turtle	G.K.	3.00	-
Turtles, unspecified	G.K.	0.02	-
Fishes, Crustaceans and Molluscs, Fresh, Dried, Salted, Smoked, or Simply Cooked			
Fresh or Frozen Fish:			
Fish fillets wrapped in sanitary paper	N.K. ^{2/}	Exempt	-
Fresh or frozen fish, unspecified	G.K.	0.03	plus 10%
Lobster, cooked, fresh or frozen	G.K.	0.03	plus 10%
Dried, Salted, or Smoked Fish:			
Dried, salted, or smoked fish	G.F.	Exempt	-
Shrimp, fresh, raw, dry or peeled	100 G.K.	0.03	plus 10%
Fresh salted or simply cooked crustaceans, unspecified	G.F.	0.03	plus 5%
Fresh, Dried, Salted, or Simply Cooked Molluscs:			
Fresh, dried, salted or simply cooked molluscs	G.K.	0.03	-
Raw Materials of Animal Origin			
Untanned Hides of Other Animals, Fresh, Dried or Salted:			
Untanned cayman, crocodile, or alligator hides up to 1.50 meters long	G.K.	10.00	-
Untanned cayman, crocodile or alligator hides more than 1.50 meters long	G.K.	5.00	-
Untanned hides of other animals, fresh, dried or salted	G.K.	0.40	-
Animal Intestines and Swim Bladders:			
Animal intestines and swim bladders	G.K.	Exempt	-
Animal Waste:			
Shark and other fish livers and liver waste .	G.K.	Exempt	plus 10%
Waste, trimmings and offal of other animals .	G.K.	Exempt	-

Nomenclature	Unit	Rate	
		Specific	Ad valorem
Turtle, Mother-of-Pearl, and Other Shells, Coral and Sponges in their Natural State:			
Bulk tortoise shell	G.K.	2.00	-
River or ocean mother-of-pearl shells	G.K.	0.01	-
Shells and conchs, bulk coral and sponges in their natural state or cleaned	G.E.	Exempt	-
Animal Matter, Unspecified:			
Shark fins	G.K.	Exempt	plus 5%
Vegetable Matter in Natural State or Simply Prepared			
Miscellaneous			
Other Plants and Parts of Plants for Sundry Uses:			
Marine Algae (state species) and sargasso ...	G.K.	Exempt	plus 10%
Foods, Beverages, Tobaccos and Products of the Chemical Industry, and Their By-products			
Preparations and conserves			
Fish, Crustacean and Mollusc Preparations and Conserves:			
Abalone in bottles, jars or tins	G.K.	Exempt	5%
Tuna in bottles, jars or tins	G.K.	Exempt	5%
Shrimp in bottles, jars or tins	G.K.	Exempt	5%
Crabs in bottles, jars or tins	G.K.	Exempt	5%
Lobster in bottles, jars or tins	G.K.	Exempt	5%
Oysters in bottles, jars or tins	G.K.	Exempt	5%
Salmon in bottles, jars or tins	G.K.	Exempt	5%
Sardines in bottles, jars or tins	G.K.	Exempt	5%
Preparations and conserves of fishes, crustaceans and molluscs, unspecified, in bottles, jars or tins (state name of products)	G.K.	Exempt	5%
Products of Various Industries			
Products of Various Industries			
Oils and Greases for Industrial Use:			
Whale oil	G.K.	Exempt	plus 10%
Manufactures of Jet, Amber, Tortoise Shell, Shell, and Analogous Materials:			
Tortoise shell and horn, transformed in any way	G.K.	Exempt	-
Mother-of-pearl transformed in any way	G.K.	Exempt	-
Coral transformed in any way	G.K.	Exempt	-
Fish scales transformed in any way	G.K.	Exempt	-
Valuables, Arms, Explosives and Miscellaneous			
Metals and Precious Stones			
Pearls and Precious Stones:			
Pearls in bulk or processed	N.G. ^{2/}	Exempt	-
Miscellaneous			
Artistic and Collectors' Items:			
Zoological, botanical, mineralogical, geological and anatomical specimens (after receiving permit from the Ministry of Public Education or the National University of Mexico, as the case may be)	G.K.	Exempt	-

Article 2. The ad-valorem rate shown in the tariff shall be applied to the price indicated for the merchandise on the commercial invoice accompanying it, except in cases covered by Article 4.

Article 3. The Ministry of Treasury and Public Credit, after hearing the opinion of the Tariff Commission, shall determine official prices for the various items exported, for the purpose of assessing the ad-valorem tax.

The official prices fixed shall be published in the Diario Oficial of the Federation and shall enter into effect on the date set in each instance by the Ministry of Treasury, but under any circumstances this must be subsequent to the date of publication in the Diario Oficial.

The Federal Executive shall establish by decree the standards to be followed by the Ministry of Treasury in determining the official prices mentioned in this article.

Article 4. When the invoice price of an item is lower than the official price determined by the Ministry of Treasury and Public Credit, the ad-valorem tax shall be calculated on the official price.

Article 5. When the merchandise exported has no official price, the commercial invoice presented for assessing the ad-valorem tax shall include a sworn declaration by the exporter to the effect that the price shown thereon is the actual market value of the merchandise. A person making false declaration shall be liable to the corresponding penal action, without prejudice to the Ministry of Treasury exacting payment of the ad-valorem tax on the market value of the merchandise.

Article 6. The Federal Executive Branch is granted authority, until December 31, 1948, to amend this Export Tax Tariff in its entirety or in part.

Article 7. The 12% aforo tax and the provisions of the decree of August 4, 1938, are abolished, as well as the Export Tax Tariff of June 14, 1939 and other related regulations, wherein they are contrary to the provisions of this Decree.

Article 8. Until such time as they are repealed or amended, the provisions of chapter "O" of the tariff classification, the rules and the vocabulary of the Export Tax Tariff of June 14, 1939, remain in effect wherein they are not contrary to the provisions of this Decree.

TRANSITORY ARTICLE. This Decree shall enter into effect on January 1, 1948.

1/Gross kilograms

2/Net kilograms

3/Net grams

(According to the American Embassy, Mexico City, the new Mexican export duty on lobsters (spiny) and raw shrimp is 31 percent lower than the previous assessments. The duty on tuna shows an increase of 76 percent and that on unspecified fish, a decrease of 37 percent. The new duties on other fisheries products appear to be in line with those studied. Free of duty are fish fillets wrapped in sanitary paper and dried, salted, or smoked fish.)



Norway

NORWEGIAN ARCTIC INSTITUTE: On December 12, the Norwegian Parliament approved the establishment of Norwegian Arctic Institute for Scientific Investigation,



according to the American Embassy, Oslo, Norway. It will begin activities February 1, 1948, under the leadership of Professor H. U. Sverdrup, for the past 11 years Director of Scripps Institute's coastal station near San Diego, Calif. The present Norwegian Svalbard and Arctic Ocean Institute will be incorporated with the new organization.

The purpose is to coordinate Norwegian activities in the Arctic and Antarctic with a view to furthering Norwegian interests in those areas. It will be divided into administrative, topographic, hydrographic, geologic, geophysics, and biologic sections. It will not concern itself with Norwegian whaling activities at the start, although this may be added to its activities later on.



Poland

DEVELOPMENT OF FISH INDUSTRY: The following article appeared in a recent Polish newspaper, according to a U. S. Embassy airgram from Warsaw, Poland, dated December 31, 1947:

Development of Fish Industry. It is anticipated that fish may become one of the most important foods for the Polish consumer and a significant export article. The yearly fresh-water fish catches nearly attain the prewar level. Poland possesses about 500,000 hectares (1,235,500 acres) of ponds and lakes. It is estimated that the yearly catch yields will increase by 20,000 metric tons.

Poland attained the prewar level of sea-fisheries in 1946. More than 40,000 metric tons were caught in 1947. The number of sea-fisheries exceeds prewar by 30 percent. The prewar per capita consumption will be exceeded in 1948, and domestic fisheries are expected to cover 90 percent of the demand.



Portugal

TRAWL FISHING REGULATIONS: The General Director of Marine of Portugal published on November 24, 1947, in the Diario de Governo, a Decree which regulates the trawl fishing fleet of Portugal. Some of the main provisions are:

1. All trawl fishing vessels must be licensed for fishing in the three zones: coastal (out to depths of 100 fathoms); high seas; and distant (Grand Banks, etc.).

2. Types, tonnage, and number of vessels may be limited.
3. Size and shape of the trawl nets and doors must have prior approval of the Central Commission of Fisheries.
4. Minimum size of mesh of trawl nets set at 2.56 inches (stretch mesh).
5. Seasons and areas for fishing may be set.
6. The number of trips per year for "distant" or "high seas" vessels may be set by the Minister of Marine.
7. Legal minimum sizes for all commercial species to be set.
8. Certain species must be gutted on board vessels.
9. Fish for fresh consumption may not be stowed in layers deeper than 31½ inches including the ice.
10. Certain safety and sanitary rules are set.
11. A report, showing area fished and quantity caught, required for each trip for vessels fishing in the "high seas" and "distant" areas.
12. The Central Commission of Fisheries is required to make technical, economic, and biological studies and investigations of the fisheries.
13. Penalties are set for violation of the different regulations of this Decree.



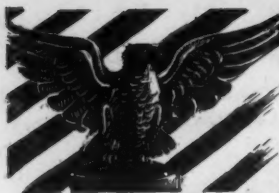
THE CUBAN SHARK INDUSTRY



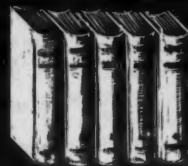
For many years, Cuban fishermen have caught large numbers of sharks and exported shark products, particularly to the United States and Germany. Until recent years, however, the industry operated in a haphazard manner. The skin frequently was the only product retained while at other times only the liver or the fins were used. More recently, shark liver oil has been shipped to the United States, while most of the meat has been used in Cuba.

Cuba now has three complete processing plants, about 20 smaller dependent ones, and about 20 collecting stations. In addition, there are two oil-rendering plants and a third one will soon be constructed. A new shark-skin tannery began commercial production in 1946.

--Fishery Leaflet 250



FEDERAL ACTIONS



Department of Commerce

TINPLATE RESTRICTIONS: The Office of Materials Distribution on January 30, 1948, in order to achieve further conservation in the use of tin for cans has set additional restrictions on the use of tinplate.

The following excerpts are from Conservation Order M-81, Direction 10:

Restrictions on over-all consumption of tin for cans. During 1948; in making cans, no person shall use more tin in the form of tinplate coating than was contained in the tinplate he received during 1947 for making cans.

Equitable distribution of cans. It is the policy of the Government that can manufacturers observe the following principles in distributing their production of cans:

- (1) Adequate provision for the food pack.
- (2) Equitable distribution among and within various groups of can users, including special consideration for small business and hardship cases and such provision as is reasonable and practical for newcomers.

Animal foods. During 1948, in making cans for packing animal food, no person shall use more tin in the form of tinplate coating than whichever is the higher of the following two amounts:

- (1) 75 percent of the amount of tin he used for this purpose during 1947; or
- (2) 75 percent of the amount of tin he used for this purpose during 1941, adjusted to reflect reduction of tin coating from a 1.25-lb. tinplate basis during 1941 to the 0.25-lb. tinplate basis now permitted by Conservation Order M-81.

Animal foods (#139). In packing animal foods, no person shall use cans having any tin-coated ends (i.e., non-soldered parts).

The specification restrictions shall become effective on February 29, 1948.



Department of the Interior

KRUG DELEGATES AUTHORITY: According to Order No. 2401, signed by J. A. Krug, Secretary of the Interior, on January 12, 1948, the following assignments of major problem areas are made:

- (a) Assistant Secretary Davidson: All matters concerning the Pacific Northwest.
- (b) Assistant Secretary Warne: All matters concerning the Territory of Alaska.

Each Assistant Secretary is charged with the responsibility of formulating a departmental program and maintaining a continuing supervision over the departmental and bureau programs and activities involved in the areas assigned.

- (a) All correspondence and orders, and matters of policy, program, or administration, which concern the Pacific Northwest and which require action at the secretarial level will be referred in the first instance to Assistant Secretary Davidson. All such matters which concern the Territory of Alaska will be first referred to Assistant Secretary Warne.
- (b) If a matter relating to a problem area originates in a bureau or office which has been assigned for supervisory purposes by 43 CFR 4.1 (Order No. 2344) to a secretarial officer other than the Assistant Secretary responsible for the problem area, the matter, after being considered by such Assistant Secretary, shall subsequently be referred to the secretarial officer to whom the bureau or office has been assigned by 43 CFR 4.1.



Reconstruction Finance Corporation

LOANS TO FISHING INDUSTRY: The Reconstruction Finance Corporation announced in the Federal Register of December 31, 1947, the following information with respect to Chapter I of Title 13:

Part 02, paragraph 02.7 - Loans to fishing industry: The authority of Reconstruction Finance Corporation to make loans to the fishing industry pursuant to section 15, Act approved June 19, 1934, expired midnight June 30, 1947. Circular No. 17, codified in 13 CFR, Part 17, therefore, is obsolete.



SÃO PAULO FISHING INDUSTRY

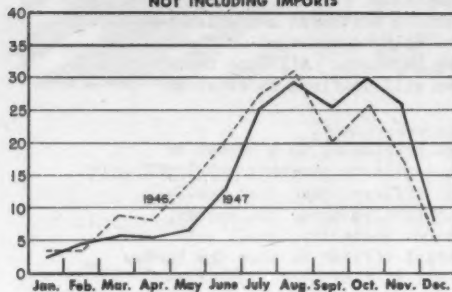
Fishing as an industry in the State of São Paulo is restricted mainly to inshore fishing in the coastal waters. Individual professional fishermen or small associations account for most of the catch, which goes primarily to the city of São Paulo and other markets within the State.

Many types of fish abound in the waters off the coast and a manner of organization for exploiting the opportunities offered has gradually been evolved. But the fishing fleet is much too small and the facilities for receiving and distributing the fish much too inadequate for a full realization of the possibilities. By the best current standards of efficiency, quantity of production, and hygiene, the São Paulo fishing industry continues in a relatively backward condition.

--Fishery Leaflet 267

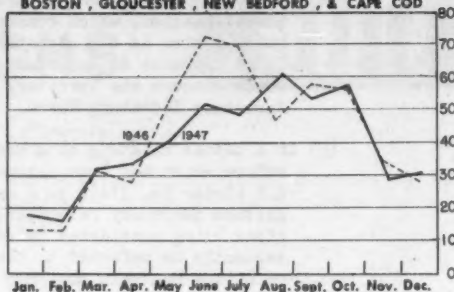
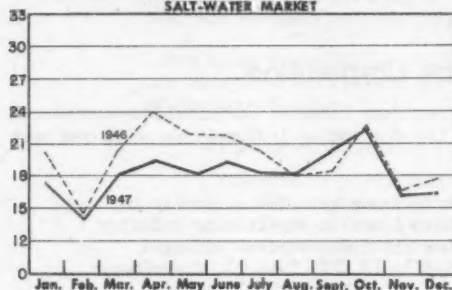
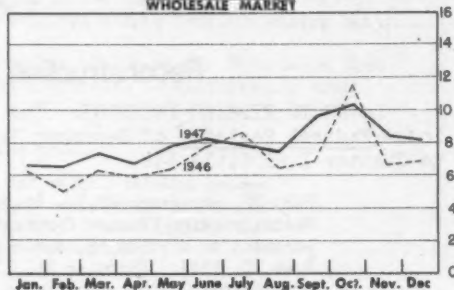
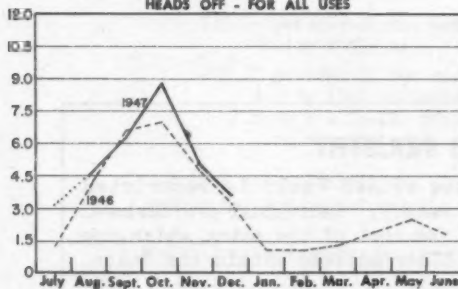
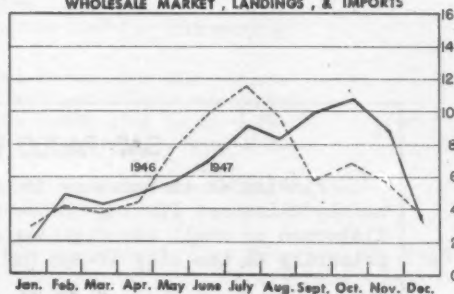
LANDINGS AND RECEIPTS

In Millions of Pounds

MAINE - LANDINGS
NOT INCLUDING IMPORTS

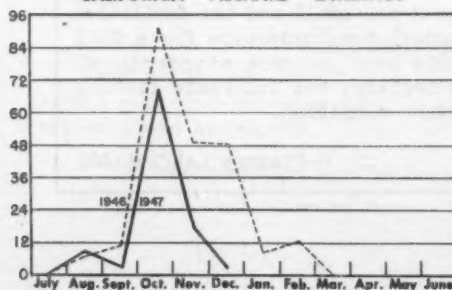
MASSACHUSETTS - LANDINGS

BOSTON, GLOUCESTER, NEW BEDFORD, & CAPE COD

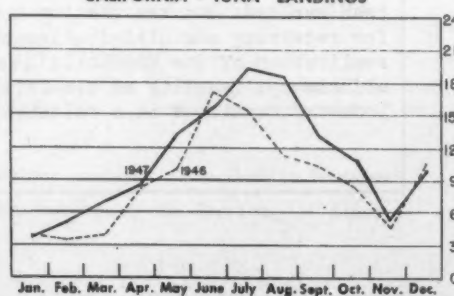
NEW YORK CITY - RECEIPTS OF FRESH & FROZEN FISH
SALT-WATER MARKETCHICAGO - RECEIPTS OF FRESH & FROZEN FISH
WHOLESALE MARKETGULF - SHRIMP LANDINGS
HEADS OFF - FOR ALL USESSEATTLE - RECEIPTS OF FRESH & FROZEN FISH
WHOLESALE MARKET, LANDINGS, & IMPORTS

In Thousands of Tons

CALIFORNIA - PILCHARD LANDINGS



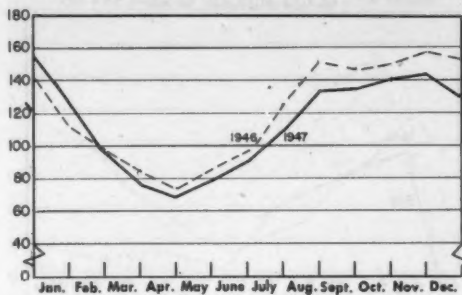
CALIFORNIA - TUNA LANDINGS



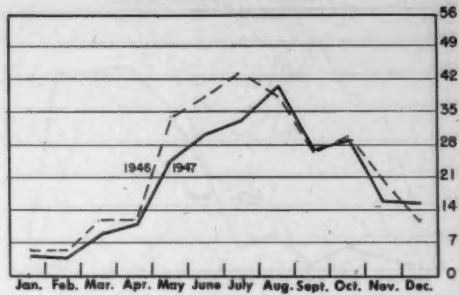
COLD STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS

In Millions of Pounds

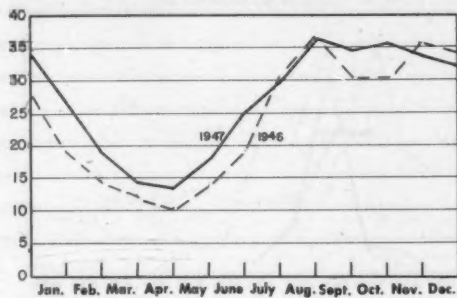
U.S. & ALASKA - HOLDINGS OF FROZEN FISH



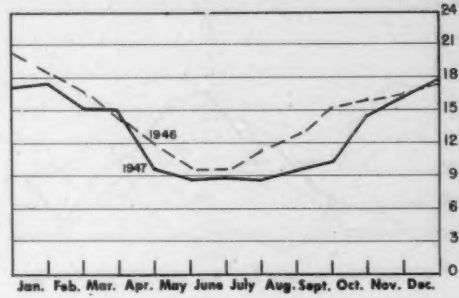
U.S. & ALASKA - FREEZINGS



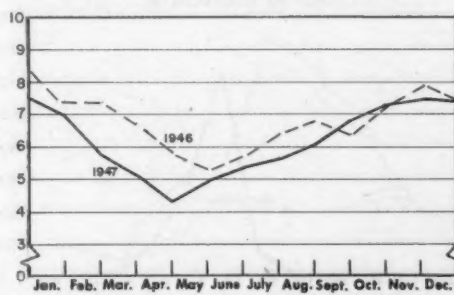
NEW ENGLAND - HOLDINGS OF FROZEN FISH



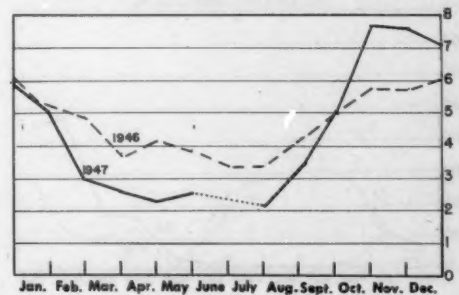
NEW YORK CITY - HOLDINGS OF FROZEN FISH



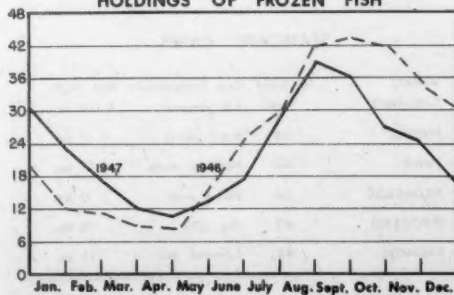
CHICAGO - HOLDINGS OF FROZEN FISH



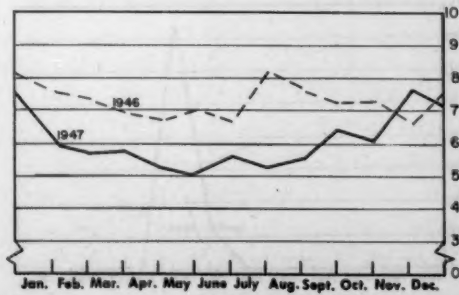
GULF - HOLDINGS OF FROZEN FISH



WASHINGTON, OREGON, AND ALASKA - HOLDINGS OF FROZEN FISH



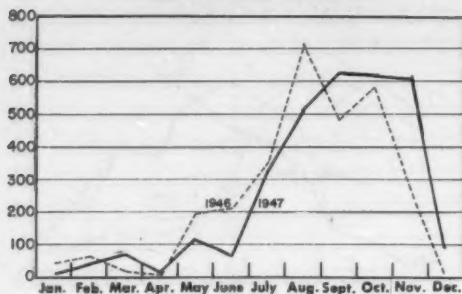
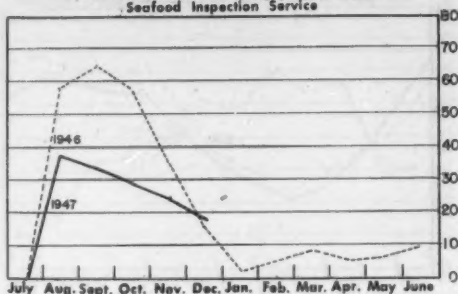
CALIFORNIA - HOLDINGS OF FROZEN FISH



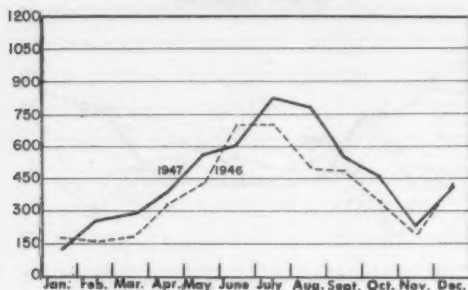
CANNED FISHERY PRODUCTS

In Thousands of Standard Cases

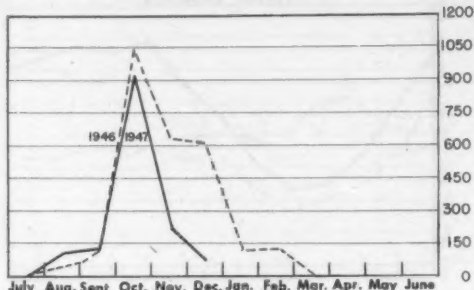
MAINE - SARDINES, ESTIMATED PACK

UNITED STATES - SHRIMP
Plants under Food and Drug Administration
Seafood Inspection Service

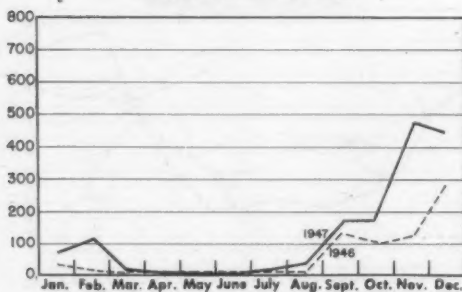
CALIFORNIA - TUNA



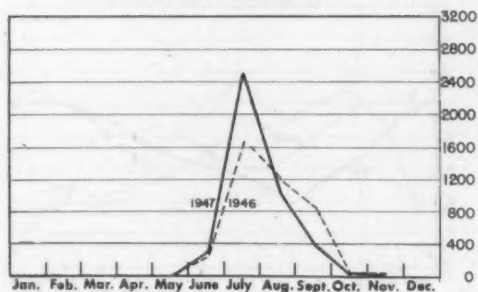
CALIFORNIA - PILCHARDS



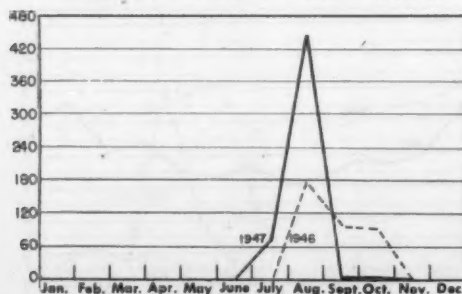
CALIFORNIA - MACKEREL



ALASKA - SALMON



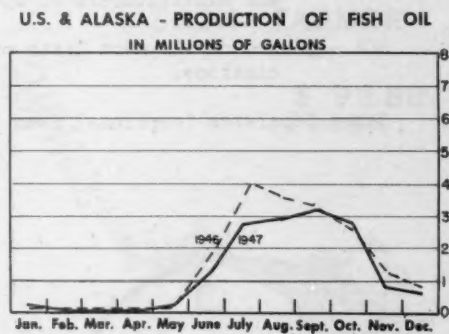
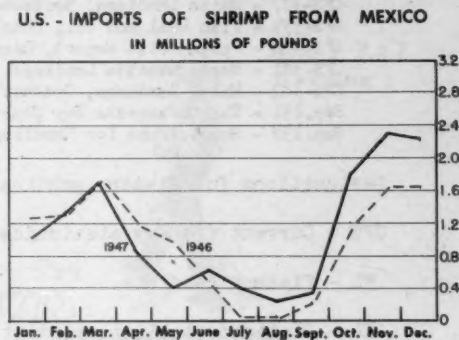
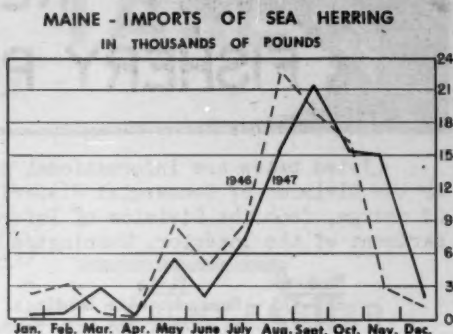
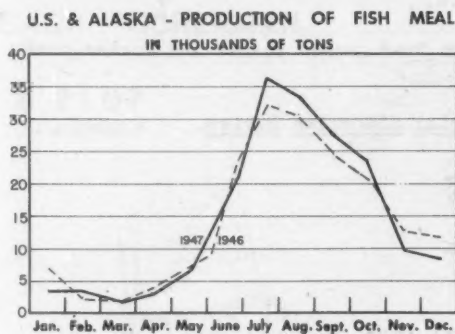
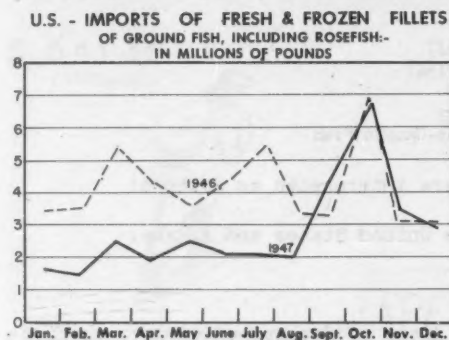
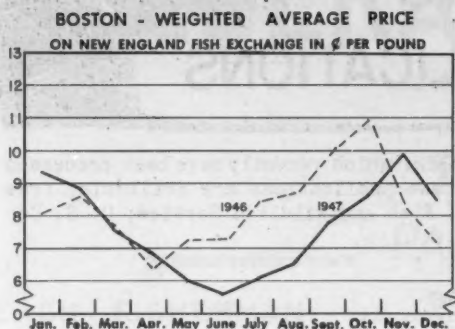
WASHINGTON - PUGET SOUND SALMON

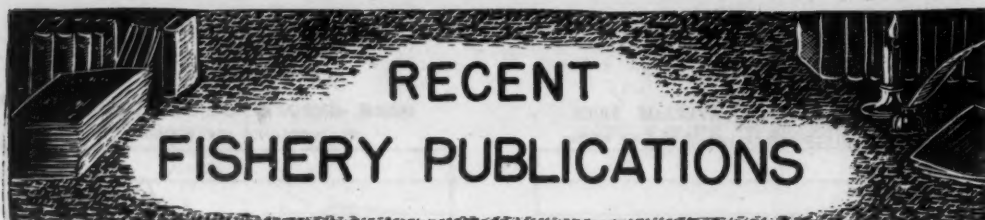


STANDARD CASES

Variety	No. Cans	Can Designation	Net. Wgt.
SARDINES	100	1/4 drawn	3 1/4 oz.
SHRIMP	48	No. 1 picnic	7 oz.
TUNA	48	No. 1 1/2 tuna	7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
MACKEREL	48	No. 300	15 oz.
SALMON	48	1-pound tall	16 oz.

PRICES, IMPORTS, and BY-PRODUCTS





RECENT FISHERY PUBLICATIONS

Listed below are informational publications which recently have been processed by the Division of Commercial Fisheries. These publications are available, free of charge, from the Division of Information, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

Number	Title
CFS-374	- Massachusetts Landings, July 1947
CFS-376	- Fish Meal and Oil, September 1947
CFS-377	- Maine Landings, September 1947
CFS-379	- Fish Meal and Oil, October 1947
CFS-380	- Frozen Fish Report, December 1947
CFS-381	- Massachusetts Landings, August 1947
CFS-382	- Maine Landings, October 1947
Sep.191	- The Chesapeake Bay Crab Industry
Sep.192	- Suggestions for Handling Trawler-Caught Fish

Designations for fishery publications are interpreted as follows:

CFS - Current fishery statistics of the United States and Alaska.

FL - Fishery leaflets.

SL - Statistical lists, consisting of lists of dealers of fishery products and manufacturers of byproducts.

MDL - Market development lists of frozen food locker plants and locker associations.

Sep.- Separates (reprints) from Commercial Fisheries Review.



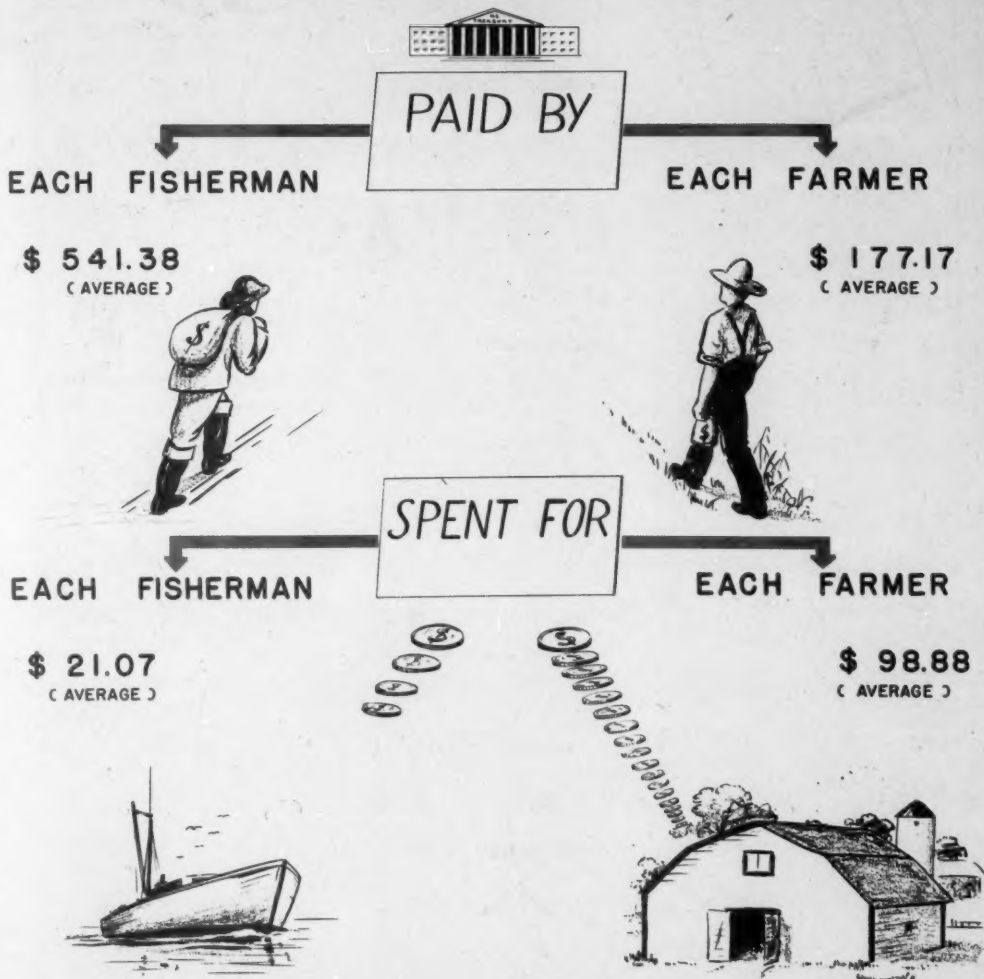
Processing -- Miscellaneous Service Division

Illustrator--Gustaf T. Sundstrom

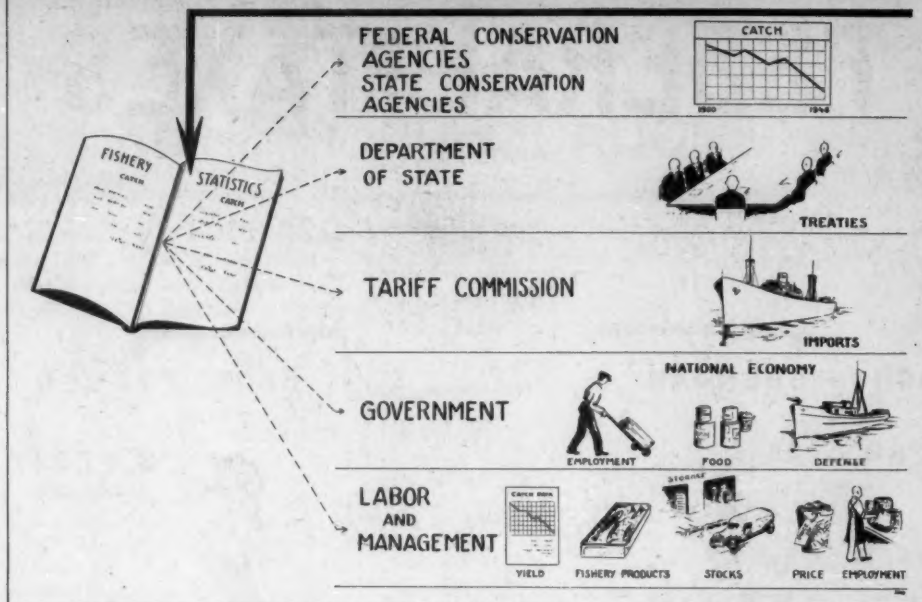
Compositors -- Jean Zalevsky and Norma D.Loeffel

FEDERAL TAXES

ANNUALLY



FISHERY STATISTICS ARE ESSENTIAL TO



128D Michigan.

Ann Arbor.

University of Michigan General Library.

Form FWS-3/48 - 2,725

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